Common Mental Disorders among Irish Jockeys: Prevalence and Risk Factors

L. King, S.J. Cullen, S. O'Connor, A. McGoldrick, J. Pugh, G. Warrington, G. Woods, A.M. Nevill & C. Losty

Abstract

Objective: Jockeys compete in a sport, horseracing, renowned for its physical and psychological demands. Previous research has identified that common mental disorders (CMDs) may be prevalent among this unique population of athletes. The aim of the present study was to further explore the prevalence of CMDs among jockeys and to test for associations with potential risk factors.

Methods: An anonymous survey was distributed to professional jockeys online. Self-report screening tools for four CMDs (psychological distress, depression, generalised anxiety and adverse alcohol use) were included alongside predictor variables from questionnaires assessing for burnout, career satisfaction, social support; and the contemplation of retirement. Binary logistic regression was used to explore associations between CMDs (not present versus present) and risk factors. Eighty-four professional jockeys completed the questionnaire (response rate = 52%).

Results: 79% of jockeys met the threshold for at least one CMDs. Prevalence ranged between CMD, including: adverse alcohol (61%), depression (35%), generalised anxiety (27%), and psychological distress (19%). Burnout, career (dis)satisfaction, lower levels of social support and the contemplation of retirement increased the likelihood of meeting the criteria for CMDs.

Conclusion: The findings indicate that jockeys report CMD symptoms at comparable rates to athletes in other sports. The study was the first to highlight potential risk factors for CMDs among jockeys, including burnout, career satisfaction, and the current contemplation of retirement. Screening tools for the risk factors demonstrated may therefore provide useful in the early identification of CMDs among jockeys. The development of jockey-specific assessment tools, education programmes and interventions may help better understand and support the mental health of jockeys.

Key words: sports, distress, anxiety, depression, alcohol, risk factors, mental health.

Word count: 4416

Introduction

Horseracing is widely regarded as a tough and demanding sport, physically and mentally, for its human competitors, jockeys. The sport places jockeys under intense weight demands, necessary to ride at low stipulated riding weights throughout competitive season which typically lasts over a protracted season, with competition taking place on most days of the year [1]. This is unique in the world of elite competition, whereas athletes competing in other weight-making sports such as boxing or rowing attempt to peak towards several targets per season, the antithesis occurs in horseracing with jockeys aligning their weight for competition up to seven times a day, around 30 minutes before each race, dependent on the particular horse they are riding [1]. Rules dictate that jockeys must "weigh in" (post-race) within ~1kg of their pre-race weight, therefore sufficient rehydration and energy replenishment is often unachievable. Other weight-making sports such as professional boxing allow the athletes 24 hours, post weigh-in to replenish energy stores and rehydrate. Moreover, jockeys compete in a dangerous sport, with frequent injury reported [2]. A recent qualitative study by Landolt et al. [3] was one of the first to shed light on the demands experienced by jockeys during their careers which include: time demands (e.g. long working hours, travel), role suppression (e.g. restricted roles as an apprentice), physical demands (e.g. maintaining weight), cognitive demands (e.g. intense periods of concentration numerous times per day), and ancillary demands (e.g. washing horses, cleaning stables). Lastly, a career as a jockey is often an uncertain one. Most jockeys are self-employed athletes, with few jockeys under contract by specific owners or trainers to ride their horses.

In light of these stressors and career experiences of jockeys, research conducted by Losty et al. [4] explored the prevalence of common mental disorders (CMDs), typically consisting of distress, anxiety, and depression, amongst a sample of professional jockeys. CMDs have been

defined as "…a syndrome characterized by clinically significant disturbance in an individual's cognition, emotion regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning. Mental disorders are usually associated with significant distress in social, occupational, or other important activities" [6, p.20). The authors found via self-report questionnaires examining symptom prevalence that 57% of jockeys met the criteria for depression, 36% for psychological distress, and 21% for generalised anxiety. Findings also identified that professional jockeys mean scores for each of the CMDs assessed were greater than a sample of amateur jockeys. Additionally, injured jockeys were 46 times more likely to meet the criteria for depression than non-injured jockeys. In comparison to other elite athletes [5, 6], rugby players [7] and soccer players [8], the prevalence of CMDs may be greater among the jockey population.

Multiple factors have been acknowledged to increase the susceptibility of elite athletes to CMDs (10), with athletes placed under intense physiological and psychological pressure, competing at an age when incidence of CMDs are most likely to occur [9]. Indeed, Arnold and Fletcher (2012) highlighted that athletes may experience up to 600 unique stressors throughout their careers that may increase the likelihood of an athlete developing CMDs. Such factors include athlete burnout, career satisfaction, low levels of social support, and difficulties associated with retirement (6,10,11). The only empirical article examining CMDs among jockeys [4] focussed predominantly on symptom prevalence, therefore understanding the factors which may contribute to the development of such symptoms was not possible (excluding injury status).

Accordingly, the aim of this study was to explore prevalence of CMDs (distress, depression, generalised anxiety, and adverse alcohol use) and their associations with specific risk factors (athlete burnout, career satisfaction, low levels of social support, contemplating retirement) among a sample of professional Irish jockeys. The primary hypothesis for the study was that

there will be significant associations between those meeting the criteria for CMDs and the presence of risk factors assessed.

Methods

Design and Participants

A cross-sectional study design was used. Professional jockeys completed an anonymous and confidential online survey using Survey Monkey which took between 15-20 minutes to complete. All professional jockeys, registered in Ireland, over the age of 16 from both flat and national hunt codes were invited to participate (n=162). Participants were recruited via emails and text messages sent by the Irish Horseracing Regulatory Board (IHRB) and racing media outlets. Reminders were sent after two and four weeks. After reading an online participant information sheet, jockeys provided informed consent. At the end of the questionnaire, links to various mental health charities and helplines were given should participants have experienced any distress while completing the questionnaire. Ethical approval was granted by a local Third Level Institution's Research Ethics Committee.

Measures

Demographic data were collected including gender, age, educational level, years holding a licence, number of winners ridden, difficulty making weight and current injury status. Internal consistency of the scales used in the present study were measured using Cronbach's alpha coefficient. Mental disorder screening tools, measured via validated self-report questionnaires, included:

Psychological distress – Psychological distress was measured using the Kessler Psychological Distress Scale (K10) [11]. The questionnaire included 10 items relating to symptoms experienced in the past four weeks (e.g. in the past 4 weeks, how often did you feel tired for

no good reason?) on a 5-point scale (1 - none of the time to 5 - all of the time). A total score ranging from 10 to 50 was obtained by summing up all of the answers on the 10 items. Higher scores indicated higher symptoms levels and a score of 22 or more indicated symptoms of distress. Cronbach alpha was measured at 0.90.

Depression – Depression was measured using the Center for Epidemiological Studies Depression (CES-D) [12] scale. The questionnaire consisted of 20 items investigating how an individual felt or behaved in the previous seven days (e.g. I felt everything I did was an effort). Responses were made on a four-point scale (0 - rarely or none of the time to 3 - most or all of the time). The score received was the sum of the 20 questions with a possible range from 0-60, higher scores indicative of higher symptoms levels. In line with previous cut-offs, a score of 16 was considered an expression of symptoms of depression. Cronbach alpha was measured at 0.82.

Anxiety – Anxiety was measured over the previous two weeks using the Generalised Anxiety Disorder (GAD) [13] scale. The questionnaire consisted of seven items (e.g. over the last two weeks, how often have you not been able to stop or control worrying?) on a four-point scale (0 - not at all to 3 - nearly every day). The GAD-7 score was calculated by adding together the scores for the seven questions (range 0-21). Higher scores indicated higher symptoms levels and in line with previous research a score of 10 or greater was indicative of generalised anxiety disorder. Cronbach alpha was measured at 0.91.

Adverse alcohol use – Alcohol consumption was measured using the three item AUDIT-C (e.g. how many standard drinks do you have on a typical day?) [14]. Scores measured between 0 and 12 and were computed by calculating the sum of the three questions, with a score of 5 or more indicative of adverse alcohol use. Cronbach alpha was measured at 0.74.

Potential risk factor questionnaires were included:

Burnout – Burnout was measured using the Athlete Burnout Questionnaire (ABQ) [15] . The ABQ contains 3 subscales with a total of 15 items measuring: (i) physical and emotional exhaustion; (ii) devaluation; and (iii) reduced sense of accomplishment. Scores were measured on a 5-point Likert scale (1 = almost never to 5 = almost always). Cronbach alpha was measured at 0.91, 0.90, and 0.84 for the physical and emotional exhaustion, devaluation and reduced sense of accomplishment sub-scales, respectively.

Career satisfaction – Career satisfaction was measured through the Greenhaus scale (e.g. I am satisfied with the success I have achieved in my career) [16] . Scores were measured on a 5-point scale ranging from extremely dissatisfied to extremely satisfied. A total score of 5 to 25 was reported by summing up the answers to the five questions, with a lower score indicating higher levels of career dissatisfaction. Cronbach alpha was measured at 0.89.

Social support – Social support was measured using the Perceived Available Support in Sport Questionnaire (PASS-Q) [17). Scoring was completed on a 5-point Likert scale ranging from not at all (0) to extremely (4), with higher scores indicating a higher perception of social support. Scales on the PASS-Q relate to four types of support including emotional, esteem, informational and tangible. Cronbach alpha was measured at 0.92, 0.92, 0.89, and 0.83 for the sub-scales measuring emotional, esteem, informational, and tangible support respectively.

Contemplating retirement – Contemplating retirement was measured using a single question (are you contemplating retirement from competing in the next 12 months? Yes/no). This variable was subsequently computed into a dichotomous figure (yes/no).

Data analyses

All data were analysed using the statistical software programme IBM SPSS Statistics 23.0. In line with other mental health epidemiological studies in sport [8], only questionnaires with adequate information completed were eligible for analysis: set at 50% of descriptive variables

and 50% of prevalence and risk factors measures. Descriptive statistics (mean, standard deviation (SD), frequency, range) were produced for all assessed measures (demographic, prevalence, risk factors). Prevalence of CMDs (psychological distress, depression, generalised anxiety, adverse alcohol use) and risk factors (burnout, career satisfaction, social support, contemplating retirement) were calculated. Tests of normality highlighted that the data was not normally distributed. Differences in demographic, prevalence and risk factor variables between flat and national hunt jockeys were calculated using Mann-Whitney and chi-square tests with a priori alpha level of 0.05 selected. Effect sizes calculated as Phi, Cramers V or Cohen's d. Binary univariate logistic regression, expressed as odds ratios (OR) and 95% confidence intervals (CI), was conducted to determine the associations between CMDs and risk factors.

Results

Participants

Eighty-four jockeys participated in the study, representing a total response rate of 52% for the professional jockey population. The jockeys (93% male; 7% female) had a mean age of 25.5 years old (SD = 6.6) and had been competing professionally in the sport of horseracing for 7.6 years (SD = 6.6; range = 0 to 31 years). A small proportion (9.5%) were injured at the time of survey completion. Statistically significant differences in age and injury status were observed between flat and national hunt jockeys. Table 1 presents all demographic characteristics of the participants.

Table 1: Participant characteristics					
	Total	Flat	National Hunt	p Value	Effect size
n	84	37 (44)	47 (56)	0.17	0.30
Jockey response rate, %	52	N/A	N/A		
Age in years, M (SD) [a]	25.5 (6.6)	23.5 (7.5)	27 (5.3)	0.02	0.53
Gender, n (%)				0.58	0.06
Male	78 (93)	35 (95)	43 (91)		
Female	6 (7)	2 (5)	4 (9)		
Highest level of education reached, n (%)				0.12	0.29
Primary school,	2 (2)		2 (4)		
Junior Certificate,	45 (56)	21 (57)	24 (51)		
Leaving Certificate,	25 (30)	14 (39)	11 (23)		
Third Level Education,	9 (11)	2 (4)	7 (15)		
Other,	3 (4)		3 (8)		
Years as a jockey, M (SD)	7.6 (6.6)	6.7 (7.6)	8.3 (5.7)	0.27	0.24
Range (years)	0-31	0-31	1-21		
Number of winners, M (SD)	182.3 (385.5)	169.3 (271.2)	192.0 (458.9)	0.79	0.06
Range (winners)	0-3000	0-1050	0-3000		
Working hours per week, M (SD)	59.7 (17.2)	59.2 (18.0)	60 (17.1)	0.84	0.04
Currently injured, n (%)†	8 (9.5)	1 (3)	7 (15)	0.06	0.21
Weight-making difficulties (1-10), M (SD)	4.7 (2.9)	4.94 (2.9)	4.54 (2.9)	0.53	0.13

[a] and † indicate statistically significant differences between flat and national hunt jockeys
[a] Mann Whitney test, $p \leq 0.05$
† Chi-square, $p \leq 0.05$

Prevalence of CMD symptoms

In total, 79% of participants met the criteria for at least one CMD, 38% met the criteria for two or more CMDs, and 18% reached the threshold for three or more CMDs. Prevalence of symptoms of CMDs varied: adverse alcohol use (61%); depression (35%); generalised anxiety (27%); psychological distress (19%). Flat jockeys reported greater mean scores on distress and generalised anxiety scales ($p \leq .05$), with national hunt jockeys scoring significantly higher ($p \leq .05$) on the depression scale. One-third of jockeys (33%) had sought help for personal or emotional problems. The most popular help-seeking source was via a counsellor or sport psychologist (20%). Prevalence and previous mental health help-seeking data, including mean

scores and those meeting the criteria for distress, depression, generalised anxiety and adverse alcohol use are included in Table 2.

Table 2: Prevalence of symptoms of CMD and reported help-seeking behaviour among jockeys in Ireland.

	Total	Flat	National Hunt
Symptom Measure (potential range), mean (SD)			
K10 (10-50),	16.7 (6.0)	17.8 (6.49)	15.9 (5.4)
CES-D (0-60)*,	12.93 (8.2)	10.2 (5.1)	15.0 (9.6)
GAD-7 (0-21),	6.5 (4.5)	6.6 (4.3)	6.4 (4.7)
AUDIT-C (0-12),	5.3 (3.0)	5.2 (2.7)	5.4 (3.2)
Diagnostic cut-off, proportion n (%)			
K10 score ≥ 22,	16 (19)	7 (19)	9 (19)
CES-D ≥ 16,	29 (35)	7 (19)	22 (46)
GAD-7 ≥ 10,	23 (27)	10 (27)	13 (28)
AUDIT-C ≥ 5	51 (61)	23 (62)	28 (60)
Met caseness for any CMD, n (%)	66 (79)	27 (73)	39 (83)
Met caseness for 2 ≥ CMD, n (%)	32 (38)	14 (38)	18 (38)
Met caseness for 3 ≥ CMD, n (%)	15 (18)	5 (14)	10 (21)
Previous mental health help-seeking history for personal or emotional problems (GHSQ) *n (%)*			
Any source	28 (33)	14 (38)	14 (30)
Psychologist	8 (1)	4 (11)	4 (9)
Doctor/GP	16 (19)	6 (16)	10 (21)
Psychiatrist	2 (<1)	0	2 (4)
IHRB Senior Medical Officer	8 (1)	2 (5)	6 (13)
Counsellor/sport psychologist	17 (20)	4 (11)	13 (28)

*Abbreviations: Common Mental Disorder (CMD); Kessler Psychological Distress Scale (K10); Center for Epidemiologic Studies Depression (CES-D); General Anxiety Disorder Questionnaire (GAD-7);Alcohol Use Disorders Identification Test (AUDIT-C); General Help Seeking Questionnaire (GHSQ). *indicates significant difference (p≤.05) between flat and national hunt jockeys.*

Risk Factors for Common Mental Disorders

As shown in Table 3, mean scores for all subscales associated with athlete burnout were within the rare to sometimes range. A total of 24 jockeys (29%) met the threshold for career dissatisfaction. Social support subscales indicated jockeys received slight to moderate levels of social support, with greater mean scores reported on the emotional and esteem support scales in comparison to informational and tangible support. In total, 26% were contemplating

retirement from a career as a jockey within the next 12 months. No significant differences were observed between flat and national hunt jockeys.

Table 3: Prevalence of risk factors among jockeys in Ireland.

Symptom Measure (*potential range*)	Total	Flat	National Hunt
ABQ (0-5), *M* (*SD*)*			
EE	2.8 (1.01)	2.70 (1.06)	2.87 (0.97)
D	2.20 (0.97)	2.06 (1.02)	2.31 (0.92)
PA	2.79 (0.86)	2.82 (0.77)	2.77 (0.93)
Career satisfaction (5-25), *M* (*SD*)	16.24 (5.08)	16.22 (5.21)	16.26 (5.03)
n (%)	24 (29)	10 (27)	14 (30)
Social support, *M* (*SD*)*			
Emotional support,	2.30 (1.23)	2.09 (1.28)	2.46 (1.17)
Esteem support,	2.05 (1.17)	1.97 (1.27)	2.10 (1.08)
Informational support,	1.98 (1.17)	2.08 (1.11)	1.89 (1.21)
Tangible support,	1.76 (1.17)	1.86 (1.13)	1.68 (1.11)
Contemplating retirement, *n* (%)	22 (26.2)	8 (27)	14 (30)

**cut-offs not provided for Athlete Burnout Questionnaire (ABQ) or social support questionnaires. Abbreviations: ABQ – Athlete Burnout Questionnaire; EE – Emotional exhaustion; D – Devaluation; PA – Reduced Sense of Personal Accomplishment.*

Associations between Prevalence of Symptoms of CMDs and Risk Factors

Individual Predictors

Table 4 highlights results from binary univariate logistic regression analysis assessing associations between prevalence of symptoms of CMDs and risk factors. Amongst professional jockeys, for each one unit increase on the athlete burnout questionnaire (ABQ), increased odds of meeting the criteria for psychological distress (EE OR=5.3; D=7.9; PA OR=8.0) and generalised anxiety (EE OR=4.7; D OR=3.0; PA OR=2.9) were observed, and to a lesser extent for depression (EE OR=1.17; D OR=1.3; PA OR=1.03), and adverse alcohol use (EE OR=1.3; D OR=1.33; PA OR=1.18). Associations between burnout dimensions were significant for psychological distress and generalised anxiety ($p \leq .05$). Greater levels of career dissatisfaction were associated with meeting the criteria for distress (OR=0.8) and generalised anxiety

(OR=0.9). Contemplating retirement was also associated with distress (OR=0.13) and generalised anxiety (OR=0.24).

Table 4: Binary univariate logistic regression analysis, expressed as OR and 95 CI's, between CMDs and assessed risk factors amongst a sample of licensed jockeys. (Numbers in brackets indicate number of individuals which did not meet the threshold for the specific CMD versus the number which did).

	Psychological distress (68:16)			Depression (55:29)			Generalised anxiety (61:23)			Adverse alcohol use (33:51)		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Burnout												
EE*	5.3	2.3-12.4	<.0001	1.17	0.75-1.84	.492	4.7	2.2-10.1	<.0001	1.30	0.83-2.04	.248
D*	7.9	2.9-21.7	<.0001	1.3	0.82-2.07	.270	3.0	1.7-5.6	<.0001	1.33	0.83-2.13	.235
PA*	8.0	2.8-23.1	<.0001	1.03	0.60-1.74	.913	2.9	1.5-5.8	.002	1.18	0.70-1.97	.538
Career satisfaction*	0.8	0.7-0.9	.003	1.01	0.93-1.10	.782	0.9	0.8-1.0	.025	0.94	0.86-1.03	.201
Social support												
ES	1.0	0.6-1.5	.854	1.15	0.80-1.68	.451	0.9	0.6-1.4	.702	1.12	0.78-1.60	.533
ESTS	0.9	0.6-1.5	.718	1.26	0.85-1.88	.248	1.0	0.7-1.5	.942	1.28	0.87-1.88	.209
IS	0.8	0.5-1.3	.409	1.01	0.69-1.49	.958	0.9	0.6-1.5	.860	0.95	0.65-1.39	.797
TS	0.7	0.4-1.2	.240	1.14	0.76-1.71	.526	0.9	0.6-1.5	.853	1.14	0.77-1.70	.515
Contemplating retirement*	0.13	0.04-0.4	.001	0.69	0.25-1.88	.465	0.24	0.1-0.7	.008	0.65	0.23-1.81	.406

Abbreviations: Emotional Exhaustion (EE); Devaluation (D); Reduced Sense of Personal Accomplishment (PA); *Emotional Support* (ES); *Esteem Support* (ESTS); *Informational Support* (IS); *Tangible Support* (TS).

Discussion

This study builds on previous research exploring the mental health of jockeys in Ireland (4), and extends our knowledge via the use of a larger sample of professional jockeys, and the inclusion of potential risk factors. Findings indicated that nearly four out of five jockeys met the criteria for at least one CMD, including adverse alcohol use (61%), depression (35%), generalised anxiety (27%), and psychological distress (19%). Thirty-eight percent met the criteria for two or more CMDs, with 18% meeting the threshold for the presence of three or more CMDs. Moreover, burnout dimensions (emotional and physical exhaustion, sport devaluation, reduced sense of accomplishment), career satisfaction and the contemplation of retirement all independently predicted meeting the criteria for distress and generalised anxiety. Regression models identified unique predictors of meeting the criteria for psychological

distress (age, emotional exhaustion, a reduced sense of accomplishment, devaluation) and generalised anxiety (emotional exhaustion, contemplating retirement).

In comparison to the study of Losty et al. [4], the presence of at least one CMD is similar (79% vs 76%), with distress (19% vs 36%) and depression (35% vs 57%) reported less in the present sample of professional jockeys, and generalised anxiety prevalence reported at a greater rate (27% vs 21%). Mean scores for CMDs varied between the two studies for depression (M=12.93 vs 20.29) and distress (M=16.7 vs 21.12), although scores for generalised anxiety were comparable (M= 6.48 vs 6.29). Differences in prevalence rates between the studies may be attributable to the sample size, with Losty et al. [4] summarising their prevalence data from 42 professional jockeys, in comparison to 84 jockeys recruited in the present study.

The prevalence rates of CMDs reported by jockeys were similar to Dutch elite athletes (anxiety/depression = 44.7%, distress = 26.6%) [19], UK professional athletes (anxiety/depression = 48%, distress = 29%) [20] and athletes from New Zealand (depression = 21%) (6) and Australia (depression = 27%, distress = 17%, anxiety = 7%) (7). However, while prevalence of adverse alcohol use among jockeys is comparable to a sample of National Rugby League (NRL) players in season (61% vs 63%) [21], these figures are greater than those previously observed Gaelic sports (23%) [22], European soccer players (14%) [23], and Dutch elite athletes (6%) [8]. Whilst these comparisons are useful in identifying sports wherein prevalence of CMDs are greater than others, accurate comparison is not without limitation due to a variety of methodological issues such as possible selection bias, differing assessments methods, the nature of self-reported data, and the diverse array of CMDs not assessed. Although it is acknowledged that the concept of mental health is often nuanced and individualised, future research projects exploring athlete mental health may attempt to use similar methodologies to facilitate comparisons between sports. Such attempts have been developed in recent years, including the athlete psychological strain questionnaire [24].

Burnout dimensions were identified as independent predictors of psychological distress and generalised anxiety. Emotional exhaustion is underpinned by the psychological and physical fatigue experienced as a result of training and competition, with reduced sense of accomplishment associated with feelings of inadequacy and competence in relation to sporting performance and achievements [15]. A multitude of factors may contribute to the development of burnout symptomology in jockeys although these relationships are yet to be established empirically. However, possible explanations for these associations may relate to the labour intensive nature of the occupation. Jockeys often work extremely long hours (60 per week in the present sample), travelling vast distances to racetracks across the country on a daily basis and competing across lengthy seasons. Moreover, unlike other sports, there is no structured off-season for jockeys, facilitating periods of rest, recovery and downtime, ensuring jockeys compete almost 365 days a year. Previous research has reported that having very few days off from either training and/or competition contributes to the development of burnout symptoms in athletes [25]. Notwithstanding this, physical and emotional exhaustion is only one part of the burnout syndrome. Research using novel burnout theory, such as the integrated model of athlete burnout [26], may help better explain the multidimensional nature of athlete burnout. The model states that antecedents (excessive training, negative performance demands, lack of recovery), feelings of entrapment (unidimensional athletic identity, performance based self-esteem), and personality, coping and the environment (perfectionism, low social support, low autonomy), all contribute to the development of the early signs of athlete burnout which has the potential to result in a wide variety of impairments. Broadening the scope of enquiry via the use of the integrated model of burnout, beyond a quantitative symptom measure, may help researchers and practitioners develop a deeper understanding of the burnout construct among jockeys.

Over a quarter of jockeys who participated in the study were contemplating retirement from the sport within the next 12 months. The findings, alongside the study of Beable and colleagues [5] investigating elite athletes, is one of the first to report the potential link between those contemplating retirement and the presence of CMDs. However, from the current study it was not possible to detect the direction of this association, whether the development of CMDs symptoms occurs via the uncertainty surrounding contemplating retirement, or CMD symptoms facilitate the thoughts of contemplating retirement. Nevertheless, from an applied perspective it is critical to acknowledge and understand jockeys' transitions throughout their careers, not only in relation to retirement, but also non-normative transitions [27], such as an apprentice (newly licensed) jockey riding out their claim quickly. Similar parallels can be drawn to the academy soccer player who unexpectedly begins playing with the first team at a young age. Understanding these transitions, as well as ensuring support is there for athletes during these periods, is of paramount importance to not only aid performance but also psychological health and wellbeing [28]. Organisations must also be aware of the impact they can have on individuals during transitional periods and designated programmes to support these athletes are recommended.

Nearly 30% of the jockeys reported dissatisfaction with their careers, with higher levels of dissatisfaction associated with meeting the criteria for distress and generalised anxiety. Similar findings occurred amongst professional athletes in the United Kingdom [20], and professional soccer players [8]. Such findings indicate that career satisfaction scales may be a useful screening measure in the early identification of CMDs [20]. Adverse alcohol use was found in 61% of jockeys, considerably greater than a sample of soccer players (19%) [8]. This figure is similar to NRL players in-season (63%) [7], with the findings from the present study also collected in-season, therefore comparison may be appropriate . Nevertheless, the context is different, given that jockeys have loosely defined seasons, with no specific beginning or end

points. Previous research among jockeys reported that alcohol accounted for a large proportion (5%) of daily energy intake [29]. According to the World Health Organisation (WHO), Ireland is one of the largest consumers of alcohol in Europe, suggesting that the culture and attitudes of the country towards alcohol may play a role in this statistic [30]. Indeed, Alcohol Action Ireland contend that 54% of the Irish population are classified as harmful drinkers [31]. The prevalence of adverse alcohol use in the present sample is of concern given the deleterious effects of alcohol on not only physical, psychological health, and athletic performance [32], but also the safety of jockeys whilst competing aboard horses running up to 65 km/h. Jockeys also reported slight to moderate levels of perceived social support, with the greatest mean score occurring on the emotional support scale, and lowest mean scores on the tangible support scale. Our findings corroborate previous research indicating that lower levels of social support may be associated with the development of symptoms of CMDs [19].

As with any cross-sectional study, the analysis does not allow for causal relationships to be identified between prevalence of CMDs and potential risk factors. Moreover, the recruitment procedures were blinded to the lead researcher and were coordinated by IHRB, therefore non-response analysis could not be conducted. The project was designed as such to ensure privacy and confidentiality of the participants. Another point to consider is the role of selection bias whereby those who completed the online questionnaire perhaps have experience of psychological morbidity, therefore increasing the prevalence rates found amongst the population of jockeys. On the other hand, mental health among jockeys remains a subject with a significant stigma attached to it, so it is plausible that prevalence rates may be under-reported. However, as the questionnaires were confidential and anonymous, the authors believe that these potential effects were limited. It is also acknowledged that the use of validated questionnaires do not provide an individual with a diagnosis of depression, anxiety or distress. An instrument such as the Patient Health Questionnaire (PHQ-9; 33) may have been more

useful in detecting depressive symptoms amongst jockeys as the questionnaire screens for symptoms over the preceding fortnight, in line with the International Statistical Classification of Diseases and Related Health Problems (ICD-10), which provides diagnostic criteria for diagnosing depression clinically. However, the CES-D was chosen (which assesses symptoms over the preceding one-week period) as this questionnaire has been used in a plethora of athlete mental studies [9], and the only jockey mental health study to date [4], allowing comparison between studies. While a diagnostic interview or clinical assessment set the gold standard for diagnosis of psychological morbidity, they were ruled out due to concerns around confidentiality, their effect on engagement with the study, and the time demands they would have placed upon participants.

The present study highlights the importance for the design of specific psychological inventories and screening methods to assess symptoms of CMDs among jockeys. The profession is a unique one and the validated screening assessments may not reflect the nuances associated with the career. Longitudinal research examining jockey mental health may also help identify areas whereby jockeys require specific support such as upon entering the sport, managing periods of losing runs, or retiring from the sport. Moreover, as per a recent mental health in sport consensus statement [33] , it would be beneficial for researchers to broaden the scope of assessment. Multiple factors impact mental health (e.g. unidimensional identity, relationship breakdowns), which current measurement tools do not consider. Psychological wellbeing is more than the absence of conditions such as depression and anxiety and awareness of such is critical for the development of theory driven research and application. The present study is one of very few to research mental health among jockeys, and the first to address a gap in the literature by exploring risk factors for jockey mental health.. It is hoped that the findings can be used by organisations associated within the sport to raise awareness of mental health issues, inform policy, and assist in developing bespoke support programmes.

Conclusion

This study is the first to investigate the prevalence rates of and associated risk factors for CMDs among jockeys. Nearly four out of five participants met the criteria for at least one CMD, with adverse alcohol use (61%) and depression the most commonly reported (35%). Burnout dimensions, career satisfaction, and the contemplation of retirement were associated with meeting the criteria for CMDs. In total, 26% of jockeys were contemplating retirement within 12 months. Future research is required to further explore the mental health of jockeys, in particular the use of questionnaires such as the Patient Health Questionnaire (PHQ-9) or clinical interviews to more accurately determine the prevalence of diagnosable mental illnesses. Moreover, longitudinal screening for symptoms of CMDs may help better support jockeys and develop understanding of specific factors that impact the mental health of this population.

References

1. Wilson G, Drust B, Morton JP, Close GL, Chester N, Eubank M, et al. Weight-Making Strategies in Professional Jockeys: Implications for Physical and Mental Health and Well-Being. Sport Med [Internet]. 2014;44(6):785–96. Available from: http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=96086422&site=ehost-live

2. O'Connor S, Warrington G, McGoldrick A, Cullen S. A 9-year epidemiologic study (2007-2015) on race-day jockey fall and injury incidence in amateur irish horse racing. J Athl Train. 2018;53(10):950–5.

3. Landolt K, O'Halloran P, Hale MW, Horan B, Kinsella G, Kingsley M, et al. Identifying the sources of stress and rewards in a group of Australian apprentice jockeys. Qual Res Sport Exerc Heal [Internet]. 2017;9(5):583–99. Available from: https://doi.org/10.1080/2159676X.2017.1340329

4. Losty C, Warrington G, Mcgoldrick A, Murphy C, Burrows E, Cullen S. Mental health and wellbeing of jockeys. J Hum Sport Exerc. 2019;14(1):147–58.

5. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington, VA; 2013.

6. Beable S, Fulcher M, Lee AC, Hamilton B. SHARPSports mental Health Awareness Research Project: Prevalence and risk factors of depressive symptoms and life stress in elite athletes. J Sci Med Sport [Internet]. 2017;20(12):1047–52. Available from: http://dx.doi.org/10.1016/j.jsams.2017.04.018

7. Gulliver A, Griffiths KM, Mackinnon A, Batterham PJ, Stanimirovic R. The mental

health of Australian elite athletes. J Sci Med Sport [Internet]. 2015;18(3):255–61. Available from: http://dx.doi.org/10.1016/j.jsams.2014.04.006

8. Du Preez E, Graham K, Gan T, Ball C, Moses B, Kuah D. Mental health issues in elite rugby league players in the NRL during a competitive season – A cross sectional epidemiological study. J Sci Med Sport [Internet]. 2017;0:72–4. Available from: http://www.jsams.org/article/S1440-2440(17)31384-1/pdf

9. Gouttebarge V, Frings-Dresen MHW, Sluiter JK. Mental and psychosocial health among current and former professional footballers. Occup Med (Chic Ill) [Internet]. 2015;65(3):190–6. Available from: http://10.0.4.69/occmed/kqu202

10. Rice SM, Purcell R, De Silva S, Mawren D, McGorry PD, Parker AG. The Mental Health of Elite Athletes: A Narrative Systematic Review. Sport Med. 2016;46(9):1333–53.

11. Frank R, Nixdorf I, Beckmann J. Analyzing the Relationship Between Burnout and Depression in Junior Elite Athletes. J Clin Sport Psychol [Internet]. 2017;11(4):287–303. Available from: http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=126700642&site=ehost-live

12. Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, et al. Screening for serious mental illness in the general population. Arch Gen Psychiatry. 2003;60(2):184–9.

13. Radloff L. The CES-D Scale: A Self-Report Depression Scale for Research in the General Population. Appl Psychol Meas. 1977;1(3):385–401.

14. Spitzer RL, Kroenke K, Williams JBW, Löwe B. A Brief Measure for Assessing

Generalized Anxiety Disorder. Arch Intern Med [Internet]. 2006;166(10):1092. Available from: http://archinte.jamanetwork.com/article.aspx?doi=10.1001/archinte.166.10.1092

15. Dawson DA, Grant BF, Stinson FS, Zhou Y. Effectiveness of the derived Alcohol Use Disorders Identification Test (AUDIT-C) in screening for alcohol use disorders and risk drinking in the US general population. Alcohol Clin Exp Res. 2005;29(5):844–54.

16. Raedeke TD, Smith AL. Development and Preliminary Validation of an Athlete Burnout Measure. J Sport Exerc Psychol. 2001;23(4):281–306.

17. Greenhaus JH, Parasuraman S, Wormley WM. Effects of Race on Organizational Experiences, Job Performance Evaluations, and Career Outcomes. Acad Manag J. 1990;33(1):64–86.

18. Freeman P, Coffee P, Rees T. The PASS-Q: The Perceived Available Support in Sport Questionnaire. J Sport Exerc Psychol. 2011;33(1):54–74.

19. Gouttebarge V, Jonkers R, Moen M, Verhagen E, Wylleman P, Kerkhoffs G. The prevalence and risk indicators of symptoms of common mental disorders among current and former Dutch elite athletes. J Sports Sci [Internet]. 2017;35(21):2148–56. Available from: http://dx.doi.org/10.1080/02640414.2016.1258485

20. Foskett RL, Longstaff F. The mental health of elite athletes in the United Kingdom. J Sci Med Sport. 2017;21(8):765–70.

21. Du Preez EJ, Graham KS, Gan TY, Moses B, Ball C, Kuah DE. Depression, Anxiety, and Alcohol Use in Elite Rugby League Players Over a Competitive Season. Clin J Sport Med. 2017;27(6):530–5.

22. Gouttebarge V, Tol JL, Kerkhoffs G. Epidemiology of symptoms of common mental

disorders among elite Gaelic athletes: a prospective cohort study. Phys Sportsmed [Internet]. 2016;44(3):283–9. Available from: https://doi.org/10.1080/00913847.2016.1185385

23. Gouttebarge V, Hopley P, Kerkhoffs G, Verhagen E, Viljoen W, Wylleman P, et al. A 12-month prospective cohort study of symptoms of common mental disorders among professional rugby players. Eur J Sport Sci. 2018;18(7):1004–12.

24. Rice SM, Parker AG, Mawren D, Clifton P, Harcourt P, Lloyd M, et al. Preliminary psychometric validation of a brief screening tool for athlete mental health among male elite athletes: the Athlete Psychological Strain Questionnaire. Int J Sport Exerc Psychol [Internet]. 2019;1–16. Available from: https://doi.org/10.1080/1612197X.2019.1611900

25. Gustafsson H, Hassmén P, Kenttä G, Johansson M. A qualitative analysis of burnout in elite Swedish athletes. Psychol Sport Exerc. 2008;9(6):800–16.

26. Gustafsson H, Kenttä G, Hassmén P. Athlete burnout: An integrated model and future research directions. Int Rev Sport Exerc Psychol. 2011;4(1):3–24.

27. Wylleman P, Alfermann D, Lavallee D. Career transitions in sport : European perspectives. Psychol Sport Exerc. 2004;5(1):7–20.

28. Schinke RJ, Stambulova NB, Si G, Moore Z. International society of sport psychology position stand: Athletes' mental health, performance, and development. Int J Sport Exerc Psychol [Internet]. 2018;16(6):622–39. Available from: http://dx.doi.org/10.1080/1612197X.2017.1295557

29. Dolan E, Connor HO, Mcgoldrick A, Loughlin GO, Lyons D, Warrington G. Nutritional, lifestyle, and weight control practices of professional jockeys. J Sports Sci.

2011;29(8):791–9.

30. WHO. Promoting Mental Health : concepts, emerging evidence, practice (Summary Report) [Internet]. World Health Organisation. Geneva; 2004 [cited 2020 Apr 6]. Available from: https://www.who.int/mental_health/evidence/en/promoting_mhh.pdf

31. Alcohol Facts [Internet]. AlcoholAction Ireland. 2020 [cited 2020 Feb 26]. Available from: https://alcoholireland.ie/facts/how-much-do-we-drink/

32. O'Brien CP, Lyons F. Alcohol and the athlete. Sport Med. 2000;29(5):295–300.

33. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: Validity of a brief depression severity measure. J Gen Intern Med. 2001;16(9):606–13.

34. Henriksen K, Schinke R, Moesch K, McCann S, Parham WD, Larsen CH, et al. Consensus statement on improving the mental health of high performance athletes. Int J Sport Exerc Psychol [Internet]. 2019;1–8. Available from: https://doi.org/10.1080/1612197X.2019.1570473